



CERTIFICATION OF TRANSLATION

I, the undersigned, hereby declare that:

I am knowledgeable in both English and Chinese languages, and

I believe that the English translation attached hereto is a true and accurate translation of Chinese Patent Application No. 200310102579.4, filed October 24, 2003.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code.

Date: March 9, 2007

Name: Ping CHEN

Signature: P. Chen

CERTIFICATE

This is to certify that the following application annexed hereto is a true copy from the records of the State Intellectual Property Office.

Application Date : 2003.10.24

Application Number : 2003101025794

Type of Invention : Invention Patnet

Title of Invention : Method for making a three-dimensional embroidery

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Inventor / Designer : Minoru Goda

**Commissioner
China State Intellectual Property Office**

Jingchuan Wang

Date : Dec. 30, 2003

Description:

METHOD FOR MAKING A THREE-DIMENSIONAL EMBROIDERY

TECHNICAL FIELD OF THE INVENTION

The present invention relates to an embroidery method, and more specifically, to a method for making a three-dimensional embroidery with a variety of colors.

BACKGROUND OF THE ART

Previously, methods like gradation are used to produce embroideries with three-dimensional patterns. The gradation method is a method through which layers of threads are accumulated to a certain height by embroidering the threads one layer after another, thereby creating a three-dimensional effect. However, to complete one pattern, the embroidery method requires large quantities of threads and a large amount of needlework. Consequently, the cost is relatively high.

Another method for making a three-dimensional embroidery is a method using fillers. The methods are recorded in the descriptions of invention patents CN 1201088A, CN 1288984A and the like. Although the patterns obtained exhibit strong three-dimensional effect, its manufacture process is relatively complicated due to the use of fillers.

There is another method in which a material rich in three-dimensional appeal, such as swansdown and the like, is first tailored into a certain pattern, followed by sewing to get a embroidery. However, the embroidery obtained by this method could not acquire three-dimensional pattern with a variety of colors.

SUMMARY OF THE INVENTION

An object of the present invention is to provide a simple and

cost-effective method for making a three-dimensional embroidery having a variety of colors.

Another object of the present invention is to provide a method for making a three-dimensional embroidery with the combination of both flat and three-dimensional patterns.

In order to achieve the above objects, the technical solutions used in the invention are as follows:

The method for making a three-dimensional embroidery of the present invention is a method for embroidering a desired pattern with an embroidery machine, comprising the steps of:

(1) stacking sequentially an intermediate layer and a top cloth on a base cloth, placing the resultant on an embroidery machine, and embroidering according to pre-designed patterns;

(2) cutting the intermediate layer at a height closer to the top cloth with a cutting tool; and

(3) removing the remaining intermediate layer from the base cloth to obtain an embroidery which is embroidered with three-dimensional patterns.

The embroidery obtained following the above steps may be further cleaned and dried, to obtain a finished embroidery.

In the method for making a three-dimensional embroidery of the present invention, prior to performing step (1), ordinary flat embroidery may be carrying out on the base cloth, or on the base cloth and the top cloth, respectively, to complete part of the patterns. Thereafter, the intermediate layer and the top cloth are stacked sequentially thereon according to step (1) and the un-embroidered part is further embroidered. If flat embroidery is performed respectively on the base cloth and the top cloth, the embroidered flat patterns on the base cloth and the top cloth should overlap when the intermediate layer and the top cloth are stacked on the base cloth.

Before the step of cutting the intermediate layer, thermal fusible films may be bonded to the base cloth and top cloth by hot extrusion to secure top

and ground threads. In such a way, complete patterns without detached threads can be obtained after removing the intermediate. In other words, it is possible to simultaneously obtain two pieces of embroidery with symmetrical patterns. In contrast, if a flat pattern is embroidered on the base cloth only, a complete pattern can only be obtained on the base cloth. The step of bonding thermal fusible film can be carried out before step (3) of removing the intermediate layer from the base cloth.

As thermal fusible film, polyamide, polyester and polyurethane type of thermoplastic resin film may be used, among which polyamide type of thermoplastic film is mainly used. However, for a polyester type of cloth, polyester type of film is used more often. However, when flexibility is taken into consideration, polyurethane type of thermoplastic film is preferably used. Specific examples of thermal fusible films are Nylon-610, polyethylene terephthalate, polybutylene terephthalate, polyethylene naphthalate and the like.

As ground thread of the embroidery, materials commonly used in the past, such as polyester yarn, cotton yarn and the like, may be used. Thermal fusible yarn or mixed yarn from two different kinds of threads may also be used. However, when thermal fusible yarn is used, the thermal fusible film described above does not have to be used.

As materials to be used as top threads of the embroidery, polypropylenes with good thermal fusibility (such as ELCHER (registered mark)), polyesters and the like can be used.

In addition, when a mixed of wool and yarn/silk is used as top thread material, it will produce a curling effect after being washed, which may bring to the users a new kind of experience.

As the intermediate layer, foamed polyurethane, foamed ethylene-acetate ethylene copolymer or felt may be used. Materials soluble in solvent or water (hot water) may also be used, and the cutting is performed after the dissolution to obtain an embroidery embroidered with three-dimensional patterns. The example of materials soluble in solvent is diacetate no-woven

fabric soluble in acetone. The example of materials soluble in water is polyvinyl alcohol fiber non-woven fabric.

According to the embroidering method of the invention, embroideries with three-dimensional patterns or patterns formed by combining flat and three-dimensional patterns can be obtained. Moreover, the manufacturing process for such embroidery is simple, convenient, and cost-effective.

DESCRIPTION OF THE DRAWINGS

FIG. 1 is a schematic diagram of a flow chart of the method for making a three-dimensional embroidery of the invention.

FIG. 2 is a schematic diagram of a flow chart of the method for making a three-dimensional embroidery with the combination of both flat and three-dimensional patterns of the invention.

In the drawings:

1, 1'-base cloth, 2-intermediate layer, 3-top cloth, 4-top thread, 5-ground thread, 6-top thermal fusible film, 7-lower thermal fusible film, 8-cutting knife, 9-flat embroidering thread, A-cutting line

MODE OF CARRYING OUT THE INVENTION

The invention will be illustrated in detail by referring to the drawings.

The specific embroidering process of the invention is the same as that of a flat embroidering. Issues such as patterns input, numerical calculation, embroidery machine output and the like belong to prior arts, which will not be described herein.

As shown in Fig. 1(a), firstly, intermediate layer 2 and a top cloth 3 is stacked sequentially on base cloth 1, and then, patterns are embroidered thereon according to pre-designed patterns with an embroidery machine (as shown in Fig. 1(b)). When pattern embroidering is completed, intermediate layer 2 is cut with cutting knife 8, along with cutting line A shown in Fig. 1(c). The cutting line A is located at a height closer to top cloth 3. Before the step of cutting

intermediate layer 2, the embroidery can be heated to a certain temperature in order to carry out the cutting process smoothly. The heating temperature depends on the material types of intermediate layer 2 and top thread 4 used. Thereafter, the remaining part of intermediate layer 2 left on base cloth 1 is removed. At this time, the three-dimensional patterns on base cloth 1 and the top cloth are symmetrical. Thus, two pieces of embroideries with symmetrical three-dimensional patterns can be obtained (as shown in Fig. 1(d)).

Moreover, before the step of cutting intermediate layer 2, thermal fusible films may be respectively bonded to base cloth 1 and top cloth 3 to secure the top and ground threads. Specifically, through hot extrusion, thermal fusible film 6 which has been heated to a temperature above its melting point is bonded to top cloth 3. At the same time, thermal fusible film 7 which has also been heated to a temperature above its melting point is bonded to base cloth 1. Thereafter, according to the method shown in Fig. 1, an embroidery which is embroidered with three-dimensional patterns is obtained by cutting intermediate layer 2 and removing the remaining part of intermediate layer 2 left on base cloth 1. By adding the step of bonding thermal fusible films prior to the step of cutting intermediate layer 2, a complete and three-dimensional embroidery without any detached part can be obtained easily. Thermal fusible films 6 and 7 may also be bonded to base cloth 1 and top cloth 3, prior to the step of cutting intermediate layer 2, with other steps remained the same as above.

According to the method for making a three-dimensional embroidery of the invention, an embroidery which is embroidered simultaneously with two styles of patterns, i.e., flat and three-dimensional patterns may be obtained. The specific process is as follows. Firstly, as shown in Fig. 2(e), flat patterns 9 are embroidered on base cloth 1'. Thereafter, intermediate layer 2 and top cloth 3 is stacked sequentially on base cloth 1' on which embroidery has been completed partly, and then, the desired patterns are embroidered thereon with the same order as that of the method shown in Fig. 1. Thus, embroidery with both flat and three-dimensional patterns is obtained, wherein the top cloth is only

embroidered with the three-dimensional part of the patterns (not shown).

The invention is further illustrated in detail according to the examples, but by no means this invention is limited only to the examples.

[EXAMPLES]

Example 1

A foamed ethylene-acetate ethylene copolymer layer (intermediate layer) and a plain polyamide liner cloth (top cloth) were stacked on a plain polyamide liner cloth (base cloth). Then, the resultant was placed on an ordinary embroidery machine, and embroidery based on pre-designed patterns was carried out. At this time, polyacrylonitrile fiber was used as the top thread and cotton yarn was used as the ground thread. After finishing patterns embroidering, the layers were heated to 150 °C . Then, the foamed ethylene-acetate ethylene copolymer layer was cut into two pieces at a height closer to the top cloth, with a cutting knife. Thereafter, the remaining part of the foamed ethylene-acetate ethylene copolymer layer left on the plain polyamide liner cloth was removed. Thus, a three-dimensional embroidery was obtained.

Example 2

With the same operations as in Example 1, except that in this example, polyamide type of thermal fusible films were respectively bonded to the top cloth and the base cloth, prior to the step of cutting the intermediate layer. An embroidery which was embroidered with three-dimensional patterns was obtained. When the polyamide films were bonded, both of the thermal fusible films bonded to the top cloth and base cloth were heated to 150°C, wherein the pressure applied was 0.3 kg/cm² for 10 seconds.

Example 3

The operations were the same as in Example 1, except that in this example, a desired flat pattern was embroidered on the base cloth prior to the

step of stacking the intermediate layer and the top cloth. At a result, the combination of both flat and three-dimensional patterns were embroidered on the based cloth, wherein the top cloth was only embroidered with the three-dimensional part of the patterns.

What is claimed is:

1. A method for making a three-dimensional embroidery product, which is a method for embroidering pre-designed patterns with an embroidery machine, comprising the steps of:

(1) stacking sequentially an intermediate layer and a top cloth on a base cloth, placing the resultant on the embroidery machine, and embroidering according to the pre-designed patterns;

(2) cutting the intermediate layer at a height closer to the top cloth with a cutting tool; and

(3) removing the remaining intermediate layer from the base cloth to obtain an embroidery product which is embroidered with three-dimensional patterns.

2. A method for making a three-dimensional embroidery as in claim 1, characterized in that

prior to performing the step (1), an ordinary flat embroidery is carried out respectively on the base cloth, or on the base cloth and the top cloth, to complete a part of the patterns, and then, the intermediate layer and the top cloth are stacked sequentially thereon according to step (1) to additionally embroider the un-embroidered part.

3. A method for making a three-dimensional embroidery as in claim 1 or 2, characterized in that

prior to the step (2) of cutting the intermediate layer 2, a step of respectively bonding thermal fusible films to the base cloth and top cloth by hot extrusion is added, through which two pieces of embroidery with symmetrical or substantively symmetrical patterns can be obtained simultaneously.

4. A method for making a three-dimensional embroidery as in claim 1

or 2, characterized in that

prior to the step (3) of removing the intermediate layer from the base cloth, a step of bonding thermal fusible film to the base cloth by hot extrusion, is added.

5. A method for making a three-dimensional embroidery as in claim 1 or 2, characterized in that

the thermal fusible film is a thermoplastic resin film.

6. A method for making a three-dimensional embroidery as in claim 5, characterized in that

the thermoplastic resin is polyamide, polyester or polyurethane type of thermoplastic resin.

7. A method for making a three-dimensional embroidery as in claim 1 or 2, characterized in that

a polypropylene or polyester type of material is used as the top thread of the embroidery.

8. A method for making a three-dimensional embroidery as in claim 1 or 2, characterized in that

a mixed wool and yarn is used as the top threads of the embroidery.

9. A method for making a three-dimensional embroidery as in claim 1 or 2, characterized in that

a foamed polyurethane, a foamed ethylene-acetate ethylene copolymer or a felt is used as the intermediate layer.

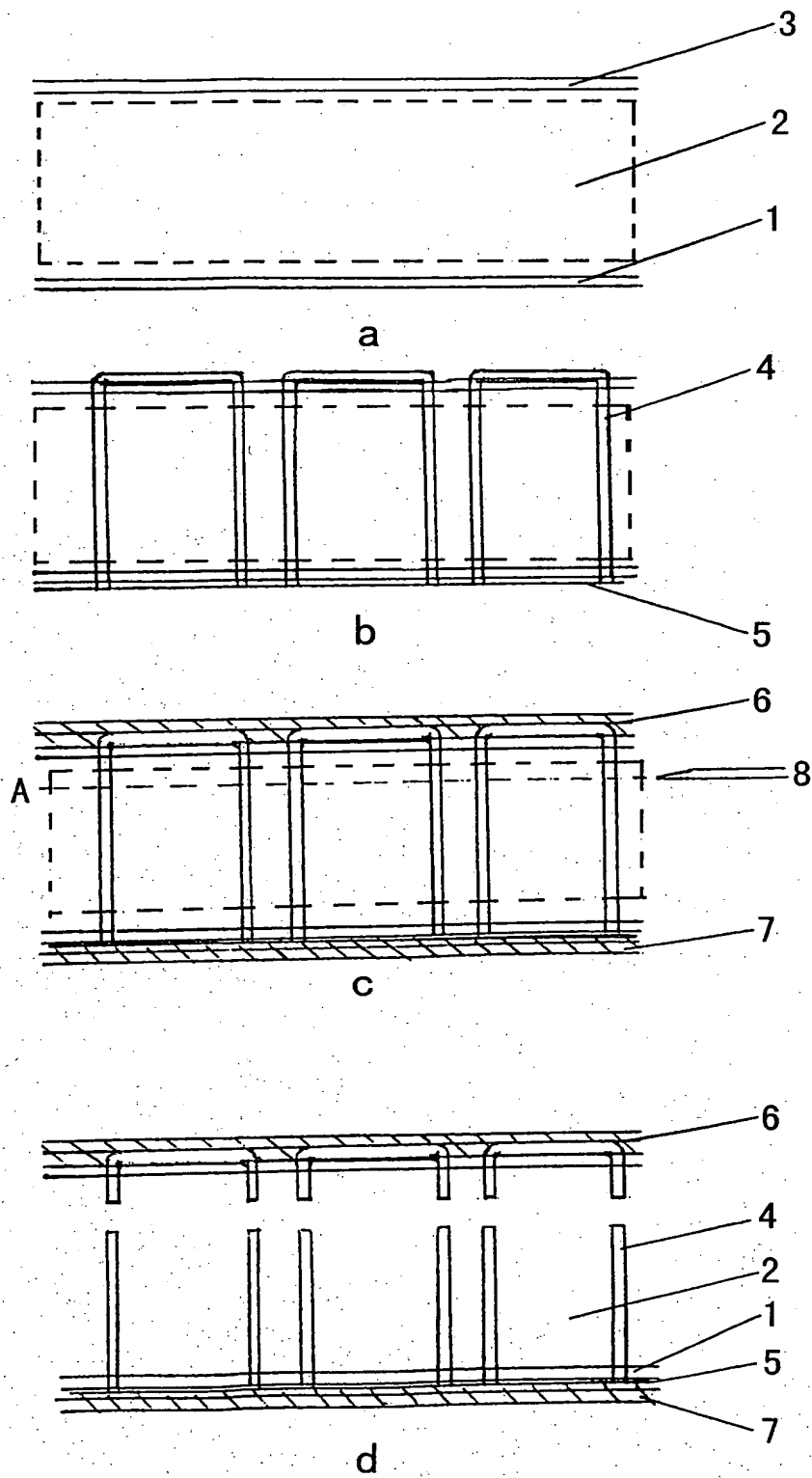
10. A method for making a three-dimensional embroidery as in claim 1 or 2, characterized in that

a material soluble in solvent or water is used as the intermediate layer, and in this case, in the step (2), the intermediate layer on the base cloth is removed with solvent or water, followed by the cutting.

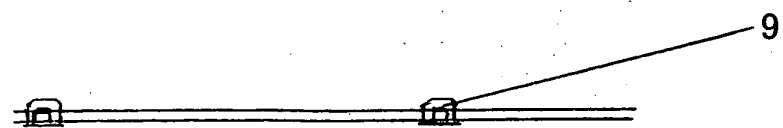
Abstract:

A method for making a three-dimensional embroidery, comprising the steps of: (1) stacking sequentially an intermediate layer and a top cloth on a base cloth, placing the resultant on the embroidery machine, and embroidering according to the pre-designed patterns; (2) cutting the intermediate layer at a height closer to the top cloth with a cutting tool; and (3) removing the remaining intermediate layer from the base cloth to obtain an embroidery product which is embroidered with three-dimensional patterns. According to the embroidering method of the invention, embroidery which is embroidered with three-dimensional patterns can be obtained. Moreover, the manufacturing process for such embroidery is simple, convenient, and cost-effective.

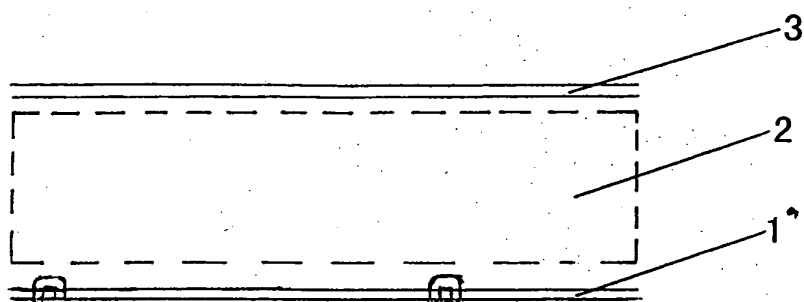
Drawings



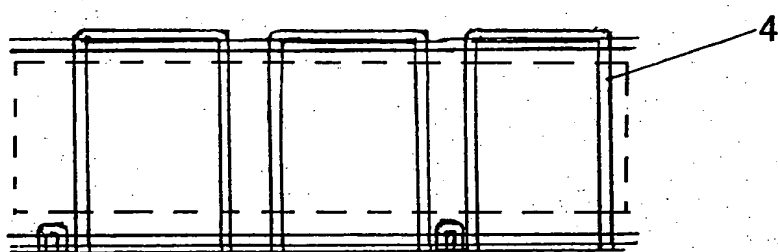
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图 1



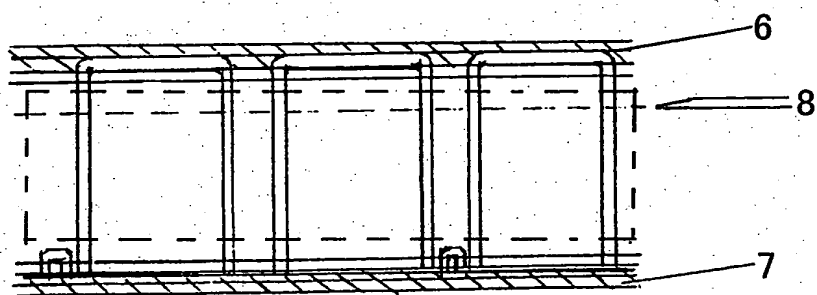
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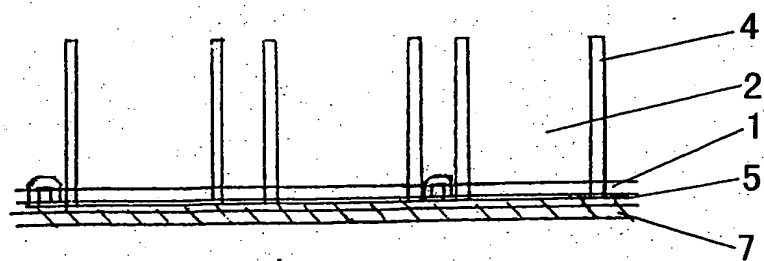
a



b



c



d

图 2